HASSELBLAD 500 C/M

Similar models: 500C

Fig. 1—top view, finder and screen removed

Fig. 2—back view, blinds open

Fig. 3—front view, mirror charged

Fig. 4—wind side, wind knob removed

Fig. 5—wind side, body shell and brake cover removed (old-style brake)

Fig. 6—front view, inner cover plate removed

Fig. 7—wind side, brake removed (mirror charged)

Fig. 8—wind side, brake removed (mirror released)

Fig. 9—wind side, mechanism plate removed

Fig. 10—mechanism plate, back view

Fig. 11—mechanism plate, front view with brake-operating disc removed

Fig. 12—front plate, back view

Fig. 13—old and new brake designs

Fig. 14—timing, blind-operating gears

ADJUSTMENT LOCATIONS:

Focusing screen	A*
Film-advance gear	B**
Key angle	C*

*requires special tool to set at factory standards

**shifting the adjustable pawl provides a fine adjustment on the position of the film-advance gear; the primary adjustment is by changing the timing between the film-advance gear and the intermediate gear.

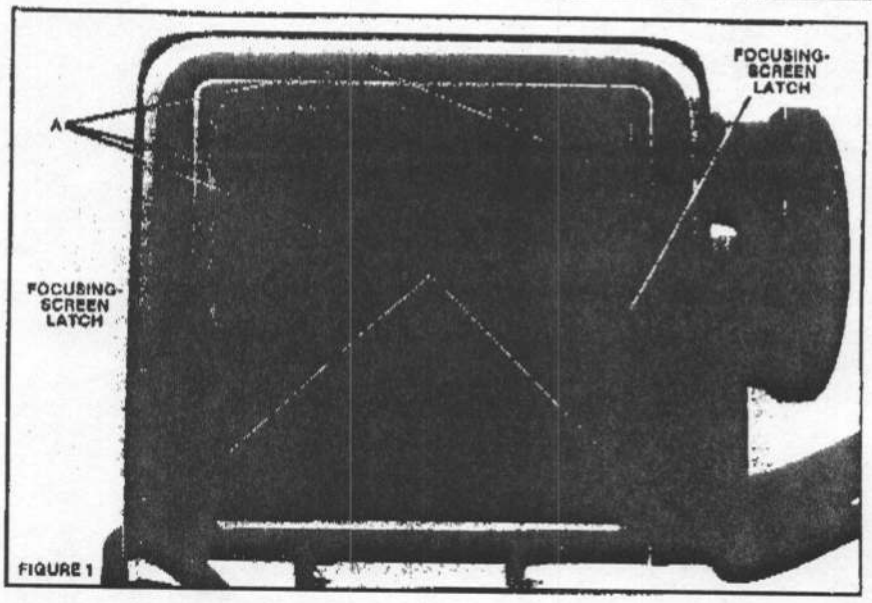

FIGURE 1

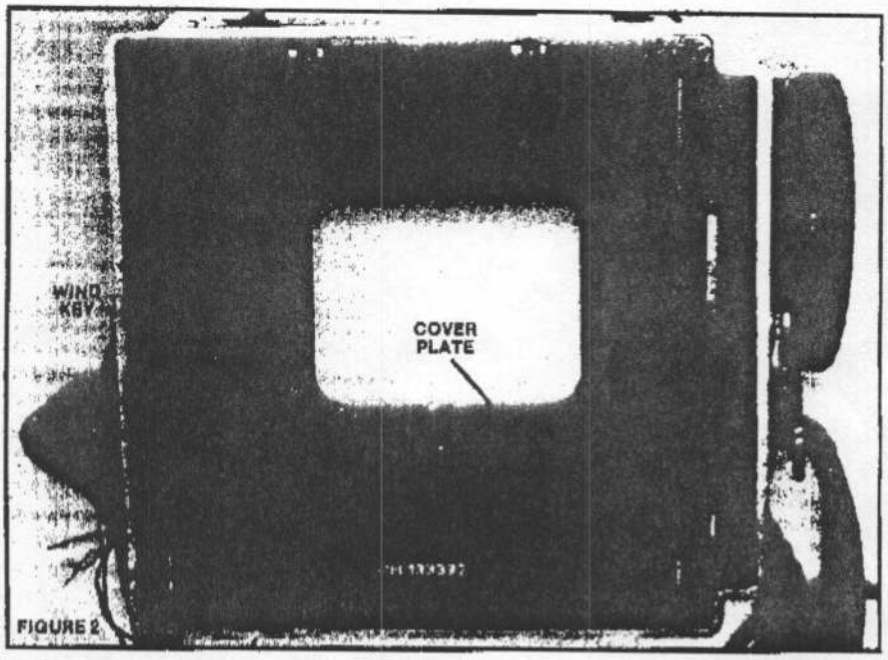

FIGURE 2

ADJUSTMENT AND TIMING VALUES:

Flange-focal distance: 74.9mm (flange to back rails)

Note: Hasselblad uses a special fixture to check flange-focal distance and parallelism. Adjustments are made by tapping the front-plate corners (from the front to decrease the distance, from the back to increase the distance).

Key angle: With the mirror charged, a line drawn through the center of the wind-key should touch the top of the red dot, Fig. 3. Adjust by loosening two screws, Fig. 5, and shifting the gear that engages the cam gear.

Initial tension, wind-key spring: 4 turns

Film-advance gear, timing: With the mirror fully charged or released, the flat section of the film-advance gear should face the back of the camera, Fig. 5. Adjust by timing the film-gear to the intermediate gear. For fine adjustments, you can shift the adjustable pawl, Fig. 5.

Initial tension, blind-operating spring (coil spring): The tension should be sufficient to close the blinds with a snap.

Timing, blind-operating gears: Time the gears as shown in Fig. 14 (with respect to the pins that operate the blinds).

TROUBLESHOOTING AND REPAIR PROCEDURES

1. Unless you have access to the fixture for checking flange-focal distance and parallelism, you should try to avoid removing the front plate, Fig. 12. However, you can clean and lubricate the wind-key without removing the front plate. Remove the cover plate of the wind-key assembly, Fig. 2 (one screw). Lubricate the base pivot for the small shaft, Fig. 12, with oil; lubricate the spring coils with grease. A dirty or dry bearing for the small shaft can prevent the wind-key from operating.
2. The camera body and the shutter must be cocked before you can remove the lens/shutter assembly. If you can't cock the shutter because of a malfunction in the camera body, push open the lower blind. Use a screwdriver to turn the wind-key from the back (clockwise), Fig. 2. Then push down the mirror to withdraw the lens lock, Fig. 6, and remove the lens by depressing the lens-release button. If you can't cock the mechanism because of a shutter malfunction, remove the plate at the back of the wind-key assembly, Fig. 2. Loosen the screw holding the wind-key assembly from the back. Then turn down screw X, Fig. 12. Turning down the screw pulls the wind key free of the shutter. Charge the mirror; then depress the lens-release button to remove the lens.
3. With the blinds open, there should be a slight space gap between the upper blind and the mirror; there should also be a slight space gap between the lower blind and the camera body. If the blinds don't open far enough, hold open the blinds (cock the mirror—then push in just the release arm, Fig. 7). Hold the nut on the blind arm, Fig. 7, with a pair of pliers. Then use your finger to stroke the back of the blind along the hinge, Fig. 2.
4. If the blinds don't open and close, the coil spring, Fig. 11, may be broken. It's difficult to rewind the old spring into the film-advance gear without distortion. However, a replacement coil spring comes mounted within a ring. To install, just push the spring out of the ring and into the film-advance gear.
5. The brake, Fig. 5, dampens the blinds. If the blinds do not snap open and shut because of a defective brake, install the modified brake assembly, Fig. 13. Hasselblad does not recommend replacing the air piston of the original brake design because of the antique value.
6. With the release slide removed, you can let off tension from or add tension to the blind-operating coil spring. To let off the tension, continue to release the blinds by pushing in the release arm, Fig. 7. To add tension, turn the ratchet wheel to charge the mechanism. Then hold the cam gear to prevent the mechanism from releasing and push in the release arm. Once again advance the ratchet wheel to add another turn of initial tension. Continue adding tension until the blinds open and close with a snap.
7. A catch or hard spot in the wind normally indicates that the mirror cam, Fig. 6, binds on the mirror-actuating arm. To correct, bend the mirror-actuating arm (straight end) away from the mirror cam.
8. If the camera works properly with the normal lens, but not with a long

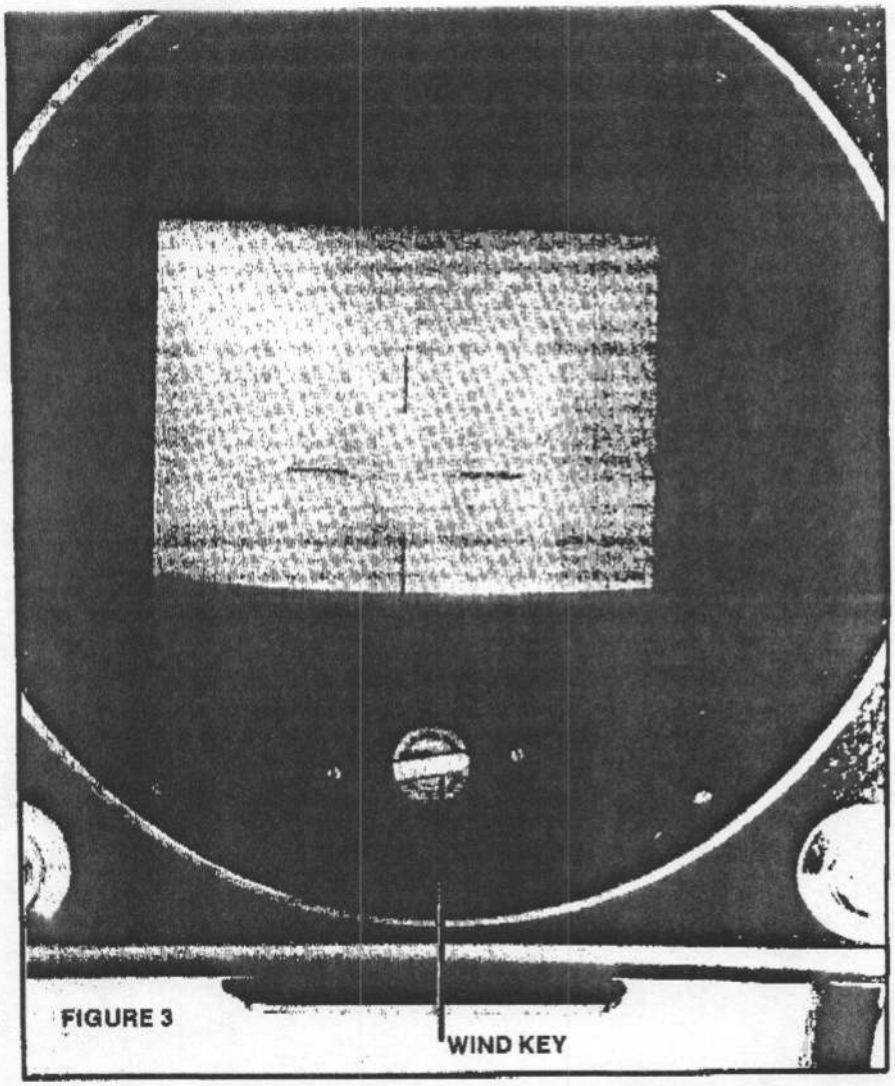

FIGURE 3

lens or an extension tube, the flange may not be parallel or the key angle may be incorrect.

OPERATOR'S INSTRUCTIONS:

1. Turning the wind knob opens the shutter and lowers the mirror. When you push the release button, the wind-key turns far enough to allow the shutter blades to close. The mirror then goes up and the blinds (flaps) open. Now the wind-key turns the remaining distance, allowing the shutter to release. The blinds close when you allow the release button to return.
2. For slow exposure, keep the release button depressed for the full exposure time. Otherwise, the blinds will close while the shutter is still open. For self-timer operation, turn the locking lever around the release button to the "T" position. When you push the release button, the release mechanism stays in to hold open the blinds. The release button returns when you set the locking lever to the "O" position.
3. The dark slide must be removed from the film magazine before the shutter will release. But the dark slide must be installed before you can remove the film magazine.
4. The shutter and the camera must be cocked before you can remove or install the lens. To remove the lens, depress the lens-release button (front of camera) and rotate the lens a partial turn.
5. The signal lever in the camera indicates whether the body is charged or released. In the released position, a red section of the signal lever shows through the wind-side window. In the cocked position, a white section shows. The magazine also has a red-and-white signal flag; the white section shows when an unexposed frame is in position. Thus, when both the magazine and the body show the white signals, the camera is ready for an exposure.

DESCRIPTION OF OPERATION:

1. Turning the ratchet wheel, Fig. 7, clockwise charges the mirror and the shutter. A pawl on the ratchet wheel picks up and turns the stop gear (under the ratchet wheel). The stop gear turns the adjustable gear, Fig. 7, which turns the cam gear clockwise. The cam gear turns the wind-key counterclockwise to cock the shutter.

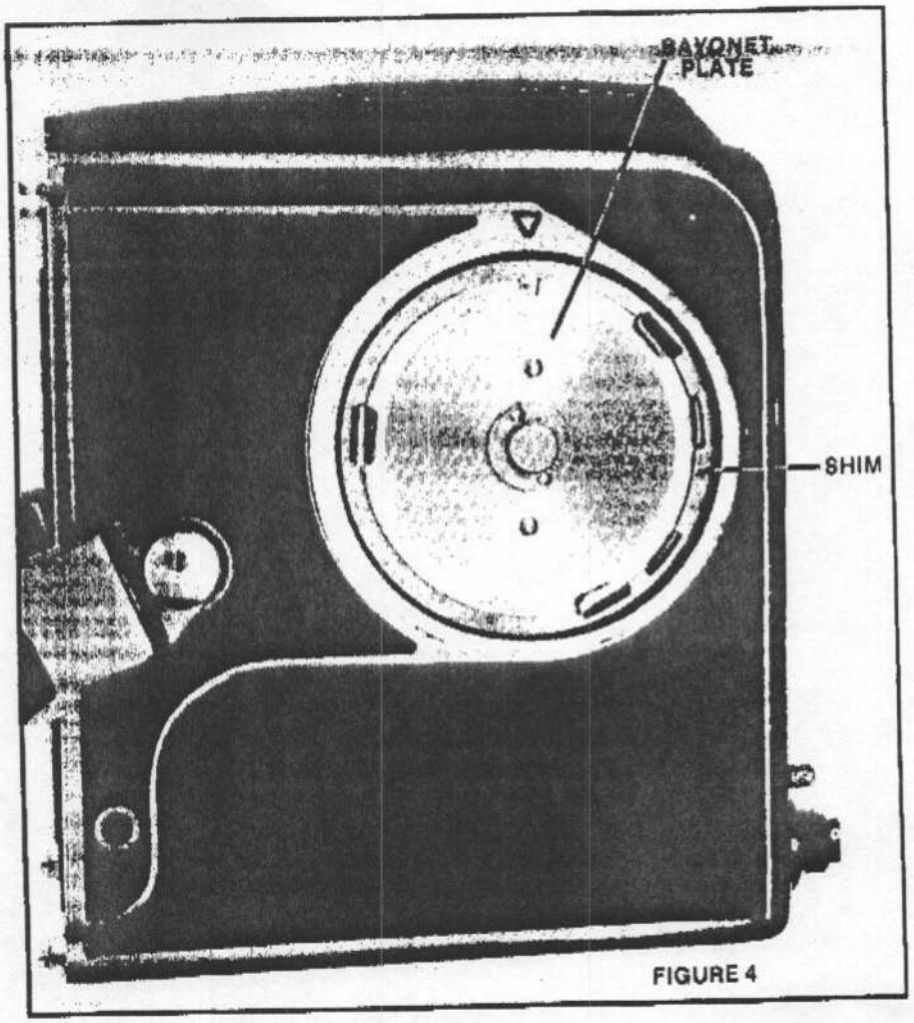

FIGURE 4

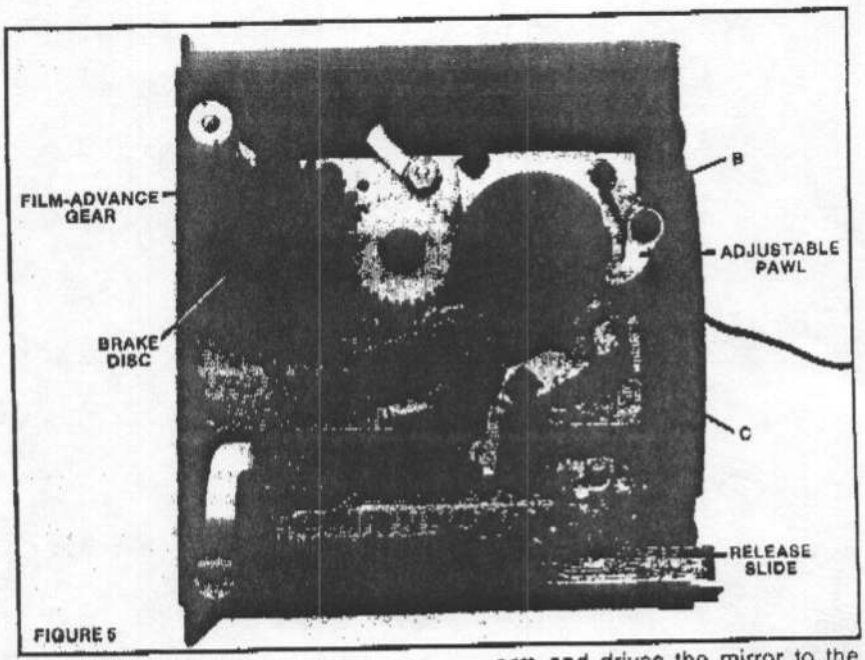

FIGURE 5

2. The mirror cam, Fig. 6, attaches to the ratchet-wheel shaft. As the ratchet wheel rotates, the mirror cam comes against the mirror-actuating arm and drives the mirror to the down position. The mirror latch holds the mirror against the tension of the mirror-actuating arm spring. As the mirror-actuating arm moves

down the mirror, it pulls the lens lock out of engagement with the lens (to permit lens removal).

3. The clockwise rotation of the ratchet wheel also turns the intermediate gear, Fig. 7, to rotate the film-advance gear (clockwise). As the film-advance gear turns, it both advances the film and adds tension to the coil spring (the spring that operates the blinds). The blinds are now latched by the rocker arm, Fig. 10, that engages a lug on the lower blind-operating gear.
4. With the mechanism fully charged, a lug on the cam gear comes against the end of the signal lever. The white section of the signal lever then moves in front of the window.
5. Pushing the release button moves the release arm. The release arm comes against a tab on the release slide. As the release slide moves toward the back of the camera, its end moves into the film magazine. If the dark slide is in place, the release slide can't move back far enough to allow the mechanism to release.
6. The upper end of the release arm now comes against the ratchet-wheel pawl (the pawl that engages the stop gear). The pawl disengages the stop gear. Now the stop gear, adjustable gear, and cam gear are free to rotate.
7. The wind-key spring drives the cam gear in a counterclockwise direction. The cam gear rotates counterclockwise until it's blocked by the release slide. During this rotation, the wind-key moves far enough for the shutter blades and diaphragm to close.
8. The mirror-release gear, Fig. 12, rotates with the cam gear. When the mirror-release gear strikes the mirror latch, the mirror moves to the up position.
9. Until the mirror moves up, the stopper, Fig. 10, prevents the rocker arm from moving. The stopper keys to the mirror-actuating arm. As the stopper moves away from the tab on the rocker arm, the S-arm spring pulls up the rocker arm. The rocker arm then frees the blind-operating gears.
10. The coil spring (inside the film-advance gear) now turns the blind-operating gears to open the blinds. The rocker arm again engages the blind-operating gear, holding the blinds open.
11. When the release button moves in the rest of the way, it pushes the release slide out of engagement with the cam gear. The cam gear now completes its counterclockwise rotation, allowing the shutter to release. The stop lever, Fig. 10, prevents the stop gear from completing the release rotation until the blinds have reached the full-open position. The upper blind-operating gear then cams the stop lever free of the stop gear.
12. The release arm and release slide return to their start positions when you let up the release button. A lug on the release arm comes against the post on the rocker arm. The rocker arm now disengages the blind-operating gear, allowing the coil spring to drive the blinds to the closed position.

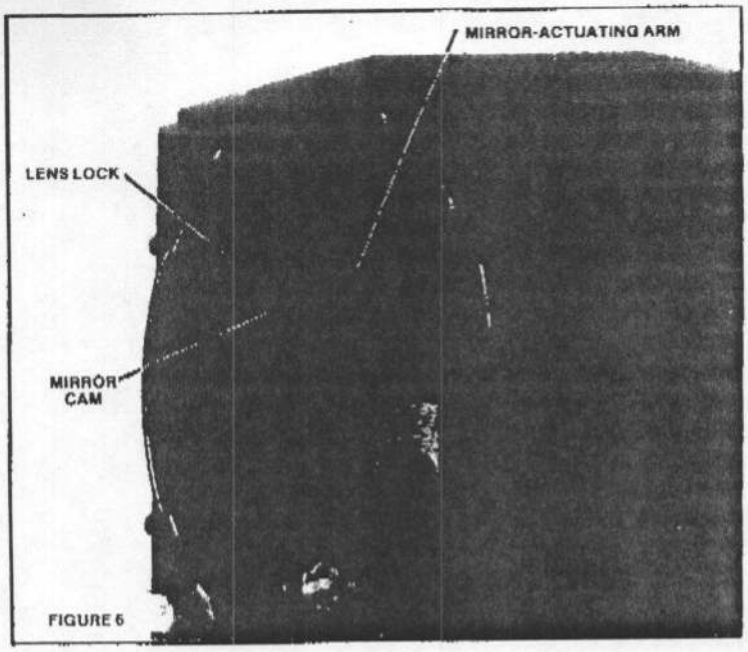

FIGURE 6

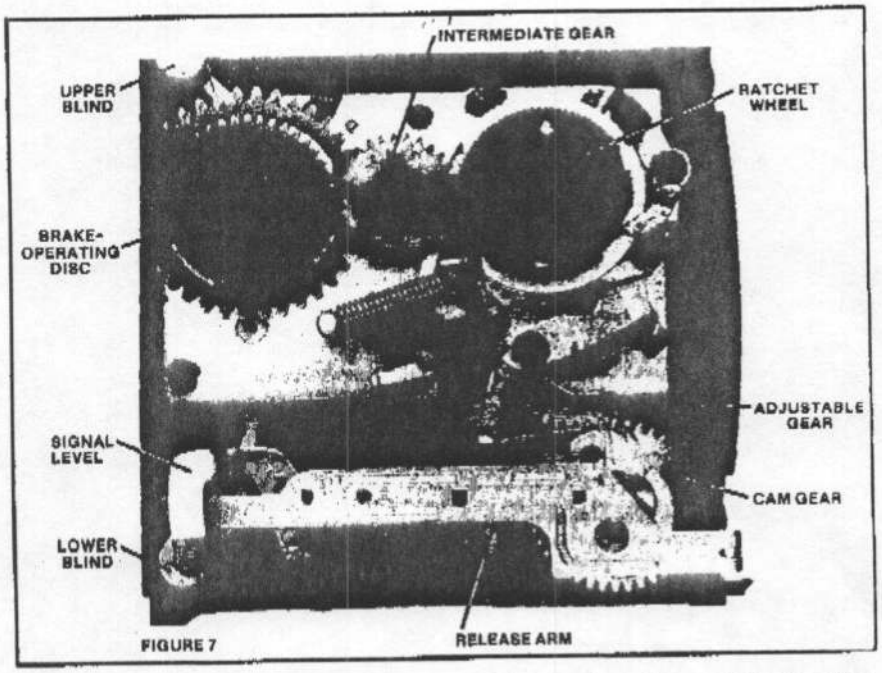

FIGURE 7

DISASSEMBLY SEQUENCE:

1. remove film magazine (latch button on top of magazine,) focusing hood (slide to back of camera), and lens
2. remove focusing screen (push 2 latches, Fig. 1, to the sides)
3. remove wind knob (disengage catch, rotate knob counter-clockwise)

4. remove shoulder screw, Fig. 4, locking washer, bayonet plate, and shim (disc under bayonet plate)
5. remove slide (plate held by 4 screws at bottom of body shell)
6. remove tripod-socket plate, bottom of body shell (2 screws)
7. push out inner body to back of body shell—teflon button over lens-release button shaft and lens-release button loose

Note: Some cameras have an external body sync terminal. After separating the inner body from the body shell, disconnect the syn wire by removing the nut, Fig. 5. Then replace the nut.

8. remove inner cover plate (1 screw) to reach mirror-operating parts, Fig. 6
9. remove cover plate over wind-key assembly to reach wind-key parts (1 screw), Fig. 2

Reassembly:

1. Seat the teflon button over the lens-release-button shaft with the tapered side facing the camera body. Replace the lens-release button in the body casting.
2. Start the inner body into the body shell at an angle, top side first. Before the inner body is fully seated, reach through the wind-knob cutout and pull forward the upper end of the mirror-up lever (S-arm), Fig. 8. The other end of the lever must sit on top of the plastic end of the mirror-lifting lever in the body shell.
3. Replace the film magazine before tightening the screws holding the tripod-socket plate. Then replace the slide at the bottom of the body casting.
4. Install the shim, Fig. 4, with its notches facing the front of the camera. The notch in the bayonet plate then faces the top of the camera.

Sequence to remove front plate and wind-key:

Note: You should not normally remove the front plate unless you have access to the Hasselblad fixture for setting flange-focal distance and parallelism.

1. remove release slide, Fig. 7 (disconnect spring from push rod—then bow up the center of the release slide until you can disengage both the ends)
2. remove countersunk screw at bottom front of camera
3. remove 2 screws at top of camera, front of focusing-screen mount (small heads)
4. remove 4 front-plate screws, 2 on each side of camera

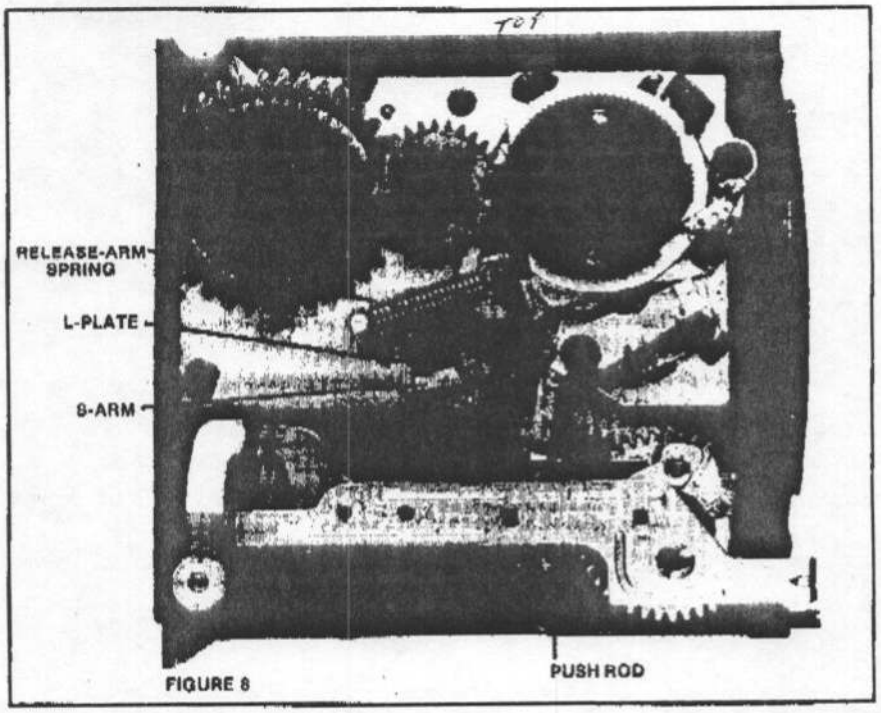

FIGURE 8

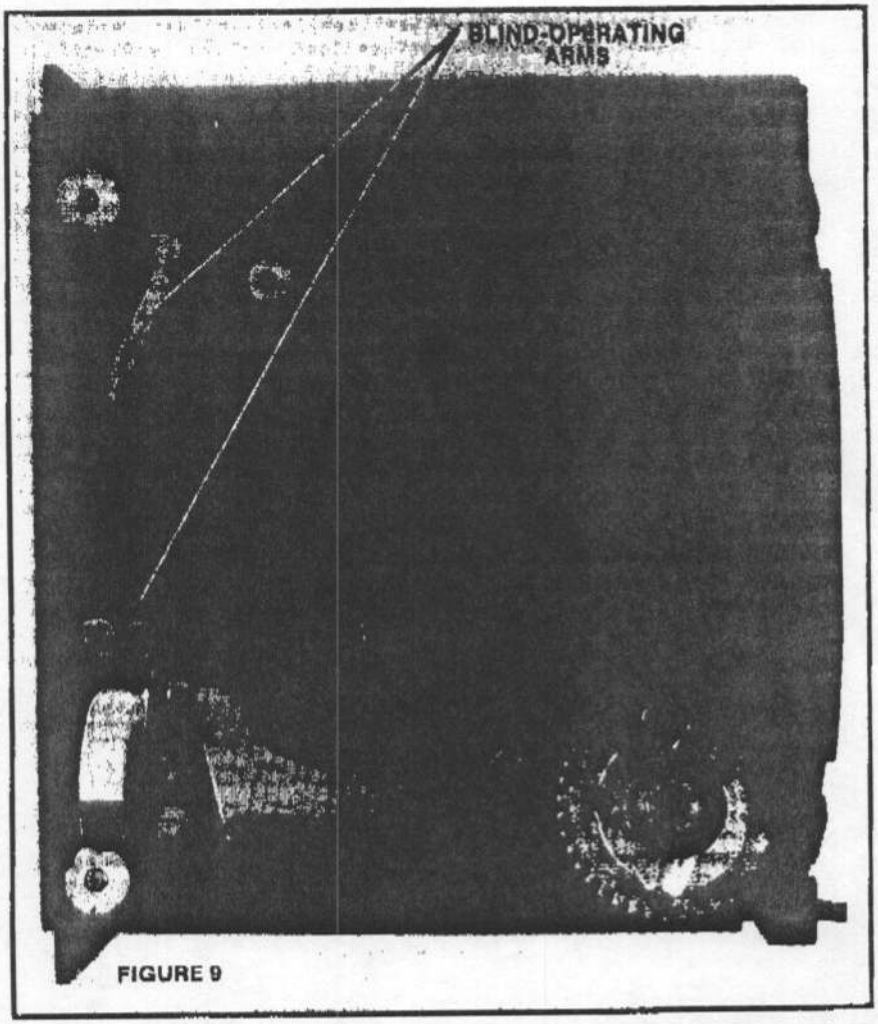

FIGURE 9

5. remove front-plate assembly, Fig. 12
6. remove cover plate over wind-key assembly (1 screw)
7. remove wind-key assembly (2 screws—1 at back and 1 countersunk at front of front plate)

Reassembly:

1. Charge the mirror before replacing the front plate.
2. Apply four turns of initial tension to the wind-key spring by turning the cam gear clockwise (as seen from the wind side, Fig. 7). The cam gear should now be in the position shown in Fig. 7 with the wind-key in the timed position, Fig. 3. Hold the wind-key gears to maintain the initial tension and seat the front plate.
3. Make sure the push rod and the lens lock pass through their holes as you seat the front plate.
4. Check the timing of the wind-key after installing the front plate. If the timing is close, make the fine adjustment by shifting the adjustable gear, Fig. 7. For a large timing error, pull aside the front plate far enough to disengage the cam gear; then turn the cam gear to change the timing.

Sequence to remove mechanism plate (front plate does not have to be removed):

1. remove release slide (disconnect spring from push rod—then bow up the center of the release slide until you can disengage both ends)
2. remove inner cover plate over mirror-operating parts, Fig. 6 (1 screw)
3. disconnect and remove release-arm coil spring, Fig. 8
4. disconnect S-arm spring, Fig. 8
5. remove S-arm (screw and shoulder bushing)
6. remove release arm together with push rod, Fig. 7
7. remove intermediate gear, Fig. 7 (1 screw—washers on both sides of gear)
8. remove mirror-actuating arm from inside body—lens-lock spring and mirror-actuating arm spring, Fig. 6, will be loose
9. remove adjustable pawl (2 screws,) Fig. 5
10. remove L-plate, Fig. 8
11. remove remaining screws holding mechanism plate (screw near ratchet wheel, countersunk screw near film-advance gear, screw at lower rear corner that holds cover plate with early style brake)
12. remove brake disc (early style brake)

Note: Do not remove the center screw holding the brake-operating disc, Fig. 8, unless you have to replace the coil spring.

13. remove mechanism plate, Fig. 10

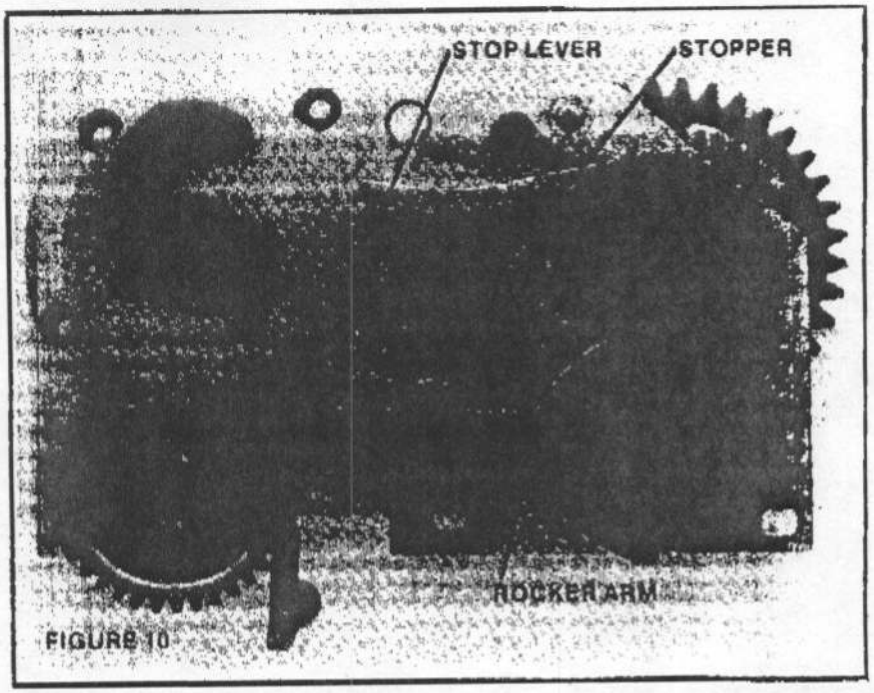

FIGURE 10

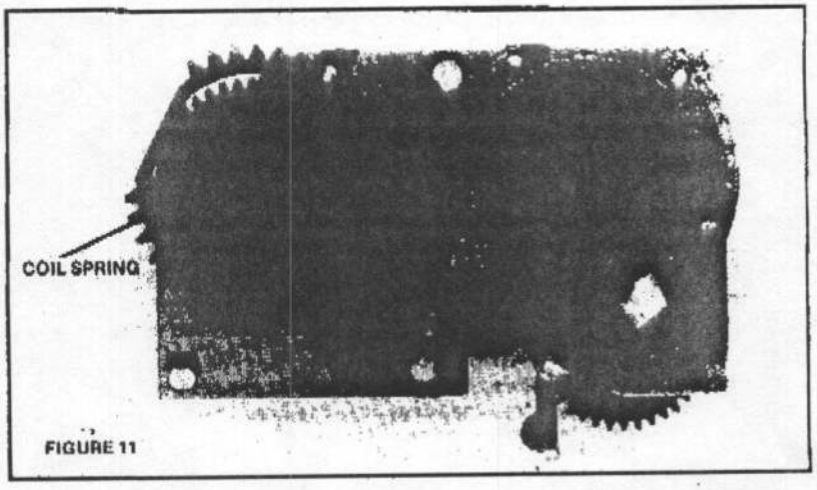

FIGURE 11

Reassembly highlights:

1. If you removed the upper blind-operating gear, Fig. 10, by taking off the brake-operating disc, time the blind-operating gears as shown in Fig. 14 (blinds-closed position).
2. If the front plate is still installed, tension the wind-key spring before installing the mechanism plate. Hold down the mirror latch. Then turn the cam gear clockwise to add tension. Allow the signal lever to engage the cam gear temporarily to hold the initial tension.
3. With the blinds and blind-operating gears in the open position, it's easier to reconnect the blind levers. Turn the film-advance gear clockwise (as seen from the front of the mechanism plate) to tension the coil spring. Then actuate the rocker arm, Fig. 10, so the blind-operating gears move to the open positions. Position the blind-operating arms in the open positions with their holes over the tracks in the body casting.
4. Turn the ratchet wheel to the start

position, Fig. 8. Turn the adjustable gear fully counterclockwise.

5. As you seat the mechanism plate, time the adjustable gear to the cam gear, Fig. 7. Since the adjustable pawl has not yet been replaced, the cam gear will not stay in the start position.
6. Position the blind-operating arms until their holes pass over the pins on the blind-operating gears. Seat the mechanism plate and replace the screws.
7. Turn the film-advance gear clockwise to the timed position and replace the intermediate gear. With the ratchet wheel positioned as shown in Fig. 7 (second notch engaged by adjustable pawl), the flat side of the film-advance gear should directly face the back of the camera.
8. Seat the mirror-actuating arm and its spring from the mirror side, Fig. 6. Make sure the fork of the mirror-actuating arm fits over the post on the mirror bracket. Also fit the slots near the pivot of the mirror-actuating arm over the tabs of the stopper, Fig. 10. Seat the lens-lock spring over the pin on the underside of the mirror-actuating arm; pass the straight end of the lens-lock spring through the hole in the front plate. Connect the mirror-actuating-arm spring as shown in Fig. 6—the hooked end over the mirror-actuating-arm and the straight side against the pin on the body casting.
9. Hold the mirror-actuating arm in position as you replace the screw at the top of the intermediate gear.
10. Replace the release arm and the S-arm. Before replacing the release slide, add the initial tension to the coil spring (see "Troubleshooting and Repair Procedures," #6).

PART NUMBERS:

coil spring—20968

mirror-actuating arm—13362

S-arm—21167

mirror-actuating-arm spring (torsion spring)—VF-86

lens lock—13280

wind-key assembly (front gear mechanism)—30383

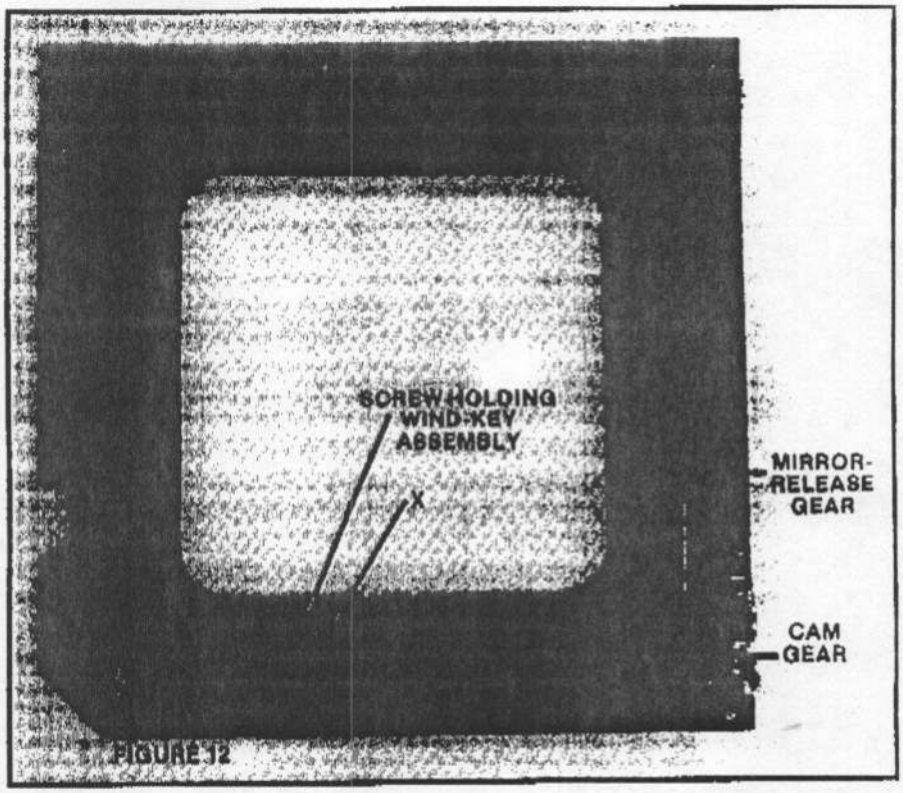

FIGURE 12

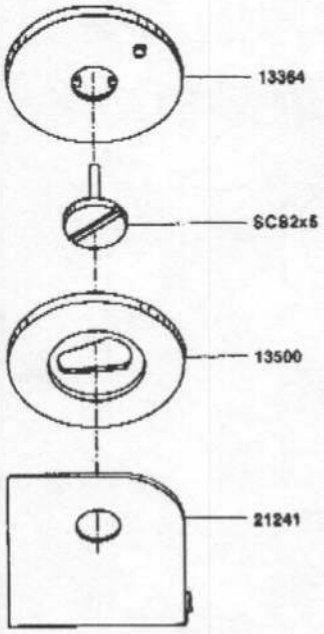

FIGURE 13

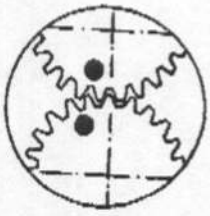

FIGURE 14